EDITORIAL COMMENT

Readmissions for Critical Limb Ischemia

Hear No Evil?*

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Hospital readmissions represent a significant health care cost and are considered a quality metric for both hospitals and health care providers alike. Much of today's emphasis on this metric originates from the 2007 U.S. Centers for Medicare and Medicaid Services (CMS) report to congress, "Promoting Greater Efficiency in Medicare" (1). In that report, the CMS argued that readmissions cost the U.S. health care system approximately $15 billion per year and that tying reimbursement to readmissions might lead to significant cost reductions. Since then, certain initiatives have taken place including the 2010 Patient Protection and Affordable Care Act that established the Hospital Readmissions Reduction Program (2). Current readmissions for congestive heart failure, myocardial infarction, pneumonia, chronic obstructive pulmonary disease, elective hip and knee replacements—and coronary artery bypass graft surgery (starting in 2017)—have been tied to reimbursement and are publicly reported.

More than 8 million individuals in the United States have peripheral artery disease, and those with its most severe clinical manifestations, rest pain, skin ulceration and gangrene (collectively known as critical limb ischemia [CLI]), consume significant health care resources, often during hospital admissions and subsequent readmissions (3). Thus, it would not be surprising if CLI were ultimately considered for inclusion among the growing list of Hospital Readmissions Reduction Program conditions. A better understanding of CLI readmission prevalence,

reasons, cost, and predictors is needed to inform such considerations.

In this issue of the *Journal*, Agarwal et al. (4) attempt to address some of these questions by analyzing readmission data from 212,241 patients with CLI from Florida, New York, and California in the Agency for Healthcare Research and Quality's State Inpatient Database. They observed unplanned 30-day and 6-month readmission rates of 24% and 48%, respectively, rates much higher than those reported for congestive heart failure and pneumonia, as examples.
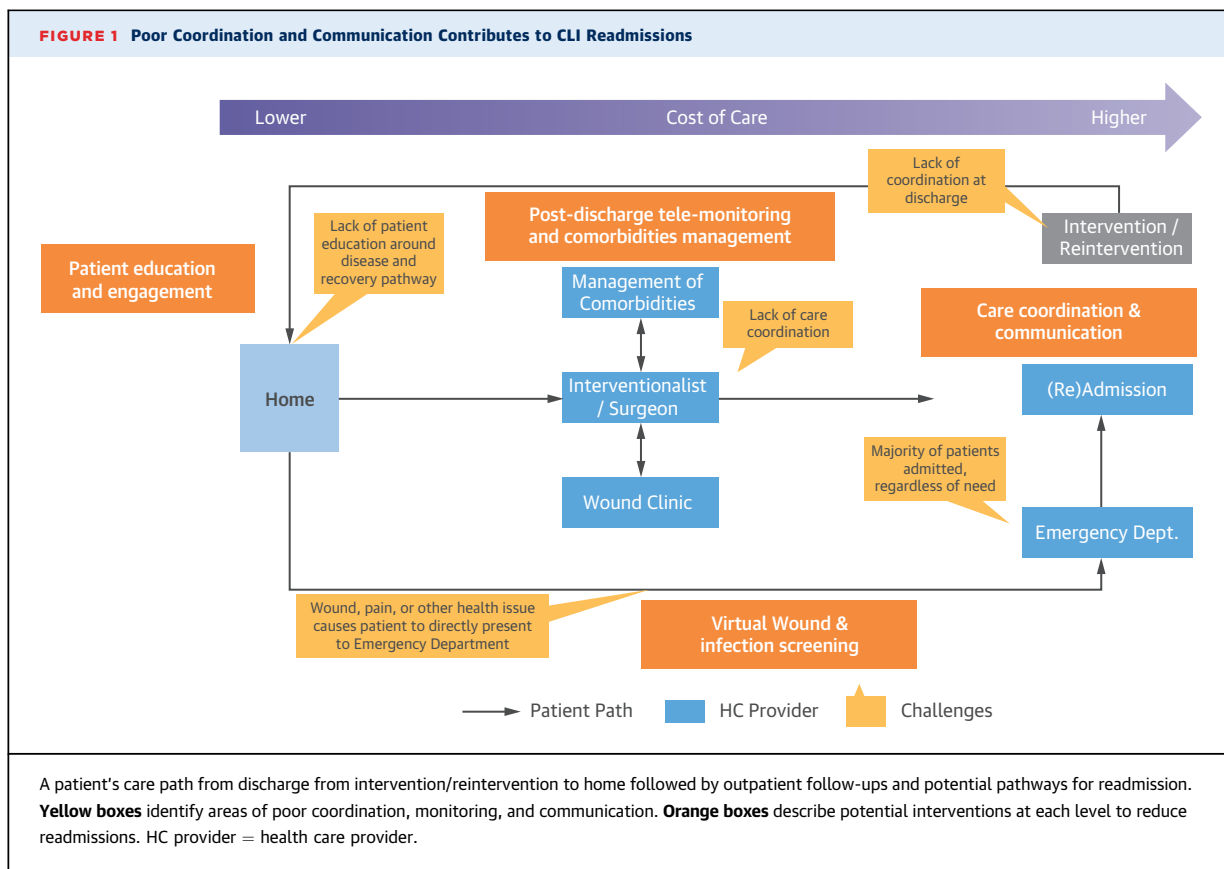
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A number of predictors for readmission were identified, notably, female sex, private insurance versus Medicare/Medicaid/no insurance, and amputation. However, travel time was inversely related to readmissions, possibly highlighting the challenges with transportation in this population. Additionally, longer duration of stay was actually associated with a higher incidence of unplanned readmissions and few patients were discharged from the hospital to home (only 33.6%), reflecting the complexity of disease and comorbidities in patients with CLI. Any revascularization was associated with lower readmissions compared with no revascularization at all. Furthermore, those who required a major amputation actually had the highest rates of readmissions both at 30 days and 6 months among the entire cohort. The authors should be congratulated on their extensive analysis by once again highlighting the burden on health care and the challenges of treating patients with CLI.

Although the distinction between planned and unplanned readmissions is relevant given that patients with CLI may require repeat admissions for planned (so-called "staged") procedures or minor amputations, the CMS defines readmissions more broadly as "admission to an acute care hospital within

FIGURE 1 Poor Coordination and Communication Contributes to CLI Readmissions

A patient's care path from discharge from intervention/reintervention to home followed by outpatient follow-ups and potential pathways for readmission. **Yellow boxes** identify areas of poor coordination, monitoring, and communication. **Orange boxes** describe potential interventions at each level to reduce readmissions. HC provider = health care provider.

30 days of discharge from the same or another acute care hospital" (2). Planned readmissions are, however, excluded from readmission reporting. Therefore, the observation that nearly 9% of readmissions at 6 months were planned requires further scrutiny. On the surface, this might suggest the complex nature of CLI treatment and the need for staged procedures beyond the index admission. However, CMS reimburses hospitals according to the highest diagnosis-related group for a given admission. If a patient undergoes revascularization followed by minor amputation, the hospital is only reimbursed for the higher of the 2 diagnosis-related groups. Hence, there may be a financial incentive to stage or bring patients back for additional procedures rather than to address them during the index admission. These competing incentives might be better aligned were reimbursements for CLI bundled under a single, longer episode of care that included wound care and/or minor amputations. More important, data regarding planned or unplanned readmissions are rarely captured correctly in administrative or even clinical databases, initiatives that can clearly capture planned versus unplanned readmissions are needed.

There are other reasons why 30-day readmission may not be a suitable quality metric for patients with CLI. Unlike coronary artery bypass graft surgery, myocardial infarction, or an acute decompensation of congestive heart failure, where the intent is to completely treat the condition during its index admission, complete healing of minor or major tissue loss after revascularization for CLI is an ongoing process whose resolution extends well beyond hospital discharge (frequently months). Furthermore, CLI disproportionally impacts those in certain geographic regions who have lower socioeconomic status (5-7). Quality of outpatient care and/or access to outpatient care may be inadequate for these individuals. Readmission penalties under such circumstances might punish those who need better care or greater access to care the most, ultimately resulting in higher rates of amputation and more prevalent nonhealing wounds.

So, what can we learn from the paper by Agarwal et al. (4) that will help to reduce readmission rates for CLI? A glance at Table 6 (Predictors of Unplanned Readmissions) reveals that most independent predictors are not modifiable. Indeed, of all of the